

DENON

Hi-Fi Pre-Main Amplifier

SERVICE MANUAL MODEL PMA-960

For EUROPEAN MODEL

SOLID STATE
PRE MAIN AMPLIFIER

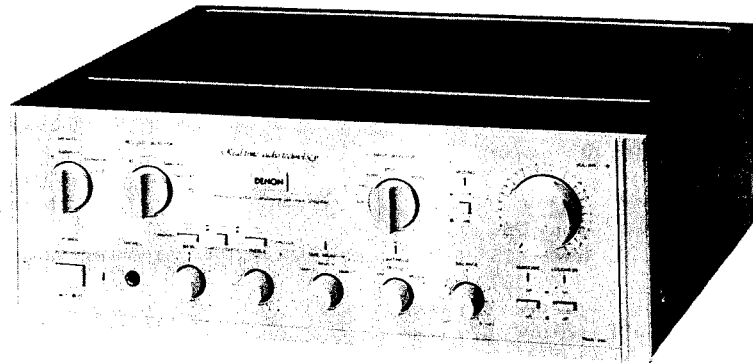


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NIPPON COLUMBIA CO., LTD.

OCT. 1984

SPECIFICATIONS

POWER AMPLIFIER SECTION

Rated Output Power: Both channel drives (TUNER → SP OUT)
 20 Hz to 20 kHz 140 W + 140 W
 (8 ohm Load)
 20 Hz to 20 kHz 170 W + 170 W
 (6 ohm Load)
 1 kHz 100 W + 100 W (Load 6 ohm,
 IEC-65 temperature-controlled output)

Total Harmonic Distortion: 0.003% (20 Hz — 20 kHz at -3 dB rated output 8 ohm Load)

Intermodulation Distortion: Below 7 kHz/60 Hz: 1/4 0.002% (at amplitude output equivalent to rate output 8 ohm Load)

Output Bandwidth: 5 Hz — 80 kHz (IHF T.H.D. 0.02% 8 ohm Load.)

Transmission Characteristics: 1 Hz — 250 kHz $+0$ dB (at 1 W output)
 -3 dB (at 1 W output)
Input Sensitivity: 150 mV
Input Impedance: 47 k ohm
Output Impedance: 0.1 ohm (1 kHz)
Output Terminals: Speaker: A or B Load 6 — 16 ohm
 A + B Load 12 — 16 ohm
 Headphone/Stereo headphone

EQUALIZER AMPLIFIER SECTION

Equalizer Amplifier Output: Maximum Output: 14.5 V (at 47 k ohm Load)
 Rated Output: 150 mV
 Total harmonic distortion: less than 0.001% (at 1 kHz, 10 V output)

Input Sensitivity/ Input Impedance:

PHONO-1, 2 MM	2.5 mV	47 k ohm
MC	high 250 μ V, low 125 μ V	100 ohm
TUNER	150 mV	47 k ohm
DAD, AUX, TAPE	150 mV	47 k ohm

RIAA Deviation: PHONO-1, 2 MM-MC within ± 0.2 dB (20 Hz — 100 kHz)

OVERALL CHARACTERISTICS

SN Ratio (IHFA Network): PHONO-1, 2
 MM 90 dB (input terminals short-circuited for 2.5 mV input)
 MC 75 dB (input terminals short-circuited for 250 μ V input)
 TUNER, TAPE, DAD, AUX: 110 dB (input terminals short-circuited)

Tone Control Adjustable Range: BASS 100 Hz ± 8 dB/50 Hz ± 8 dB
 TREBLE 10 kHz ± 8 dB/20 kHz ± 8 dB

Filtering Characteristics: SUBSONIC 18 Hz, 6 dB/oct
Loudness Characteristics: Low frequency 100 Hz + 7 dB
 High frequency 10 kHz + 6 dB

Muting Characteristics: -20 dB

POWER SOURCE: Germany and France AC 220 V, 50 Hz;
 U.K. and Australia AC 240 V, 50 Hz;
 U.S.A. and Canada AC 120 V, 60 Hz;
 Asia 110/120/220/240 V, 50/60 Hz (Multiple)

POWER CONSUMPTION: 280 W (U.S.A.); 660 VA (Canada); 310 W (IEC); 245 W (Multiple)
DIMENSIONS: 470 mm (18-1/2")W x 168 mm (6-39/64")H x 440 mm (17-21/64")D (including rubber feet, control knobs, and terminals.)

WEIGHT: 15 kg (33 lbs 1 oz)

Design and specifications are subject to change without prior notice.

NOTE: The following codes correspond to the appropriate models.
 E1 for Asia, E2 for Europe, E3 for U.S.A., EA for Australia, EC for Canada etc.
 This Service Manual is prepared based on E2.

CONTROL AND FUNCTIONS

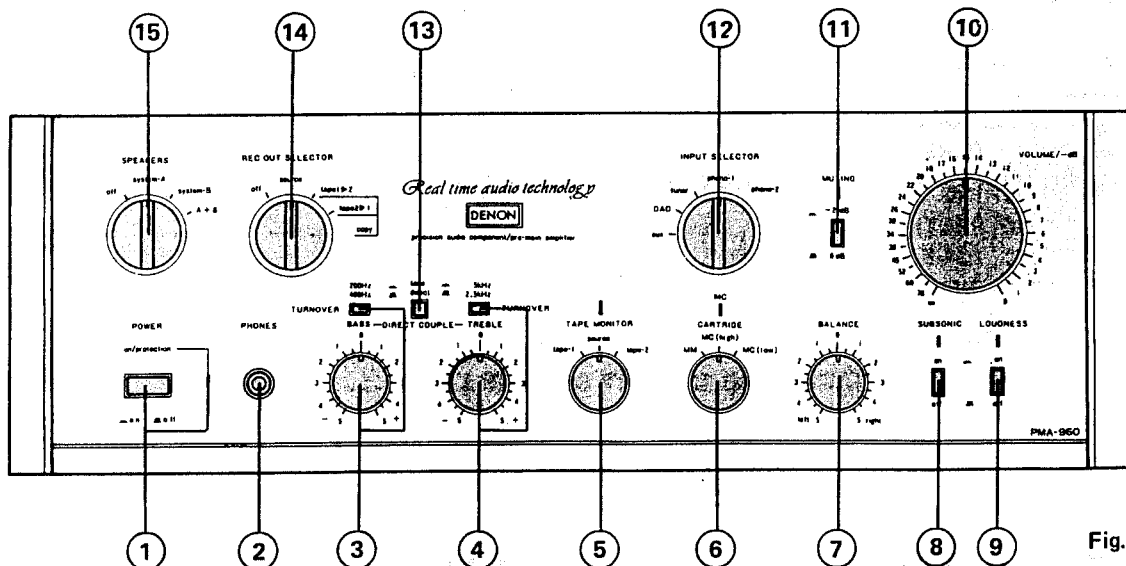


Fig. 1

CONNECTIONS

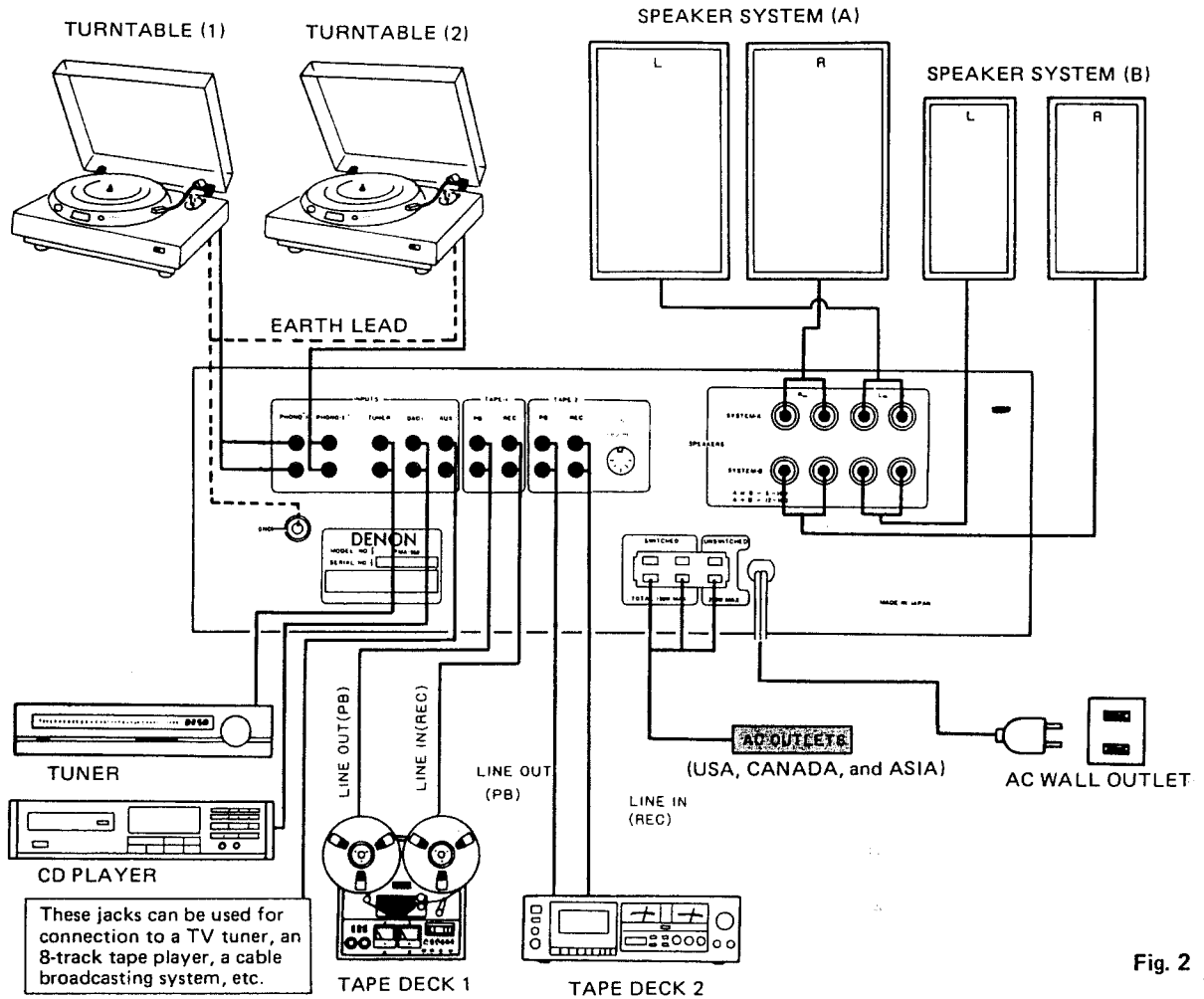


Fig. 2

- Do not plug the power source cord into an AC outlet until all the connections are completed.
- Connect the right (R) channel plug to the right (R) channel jack, and the left channel plug to the left channel jack.
- Insert the plugs firmly into the corresponding jacks. If a connection is incomplete, noise may be generated.
- Plug the power source cord for audio equipment into the AC OUTLETS terminal. Do not use this terminal for other electric appliances such as hair dryer. (NOT INCLUDED IN SYSTEM FOR EUROPEAN USE)
- Do not bundle the pin plug cords with the power source cord and do not place the pin plug cords near the power transformer, or humming and other noise may be generated.
- Always connect the pin plug cord to the input terminal "PHONO" because this terminal is highly sensitive. If this terminal is not connected, induction hum may be generated.

NOTES FOR SHORTING PIN

Two shorting pins are inserted the PHONO-1 terminal on the rear panel of this unit. When a player connected to the PHONO-2 terminal, leave the shorting pins as they are. When connecting a player to the PHONO-1 terminal, remove the shorting pins and insert them into the PHONO-2 terminal. Do not attempt to insert the shorting pins into the REC terminal or this unit may not work properly.

In case of shorting pins are removed, insert them into the unused terminals (TUNER, DAD, AUX, PB-1 or PB-2) or save them for reuse.

METHOD OF ADJUSTMENTS

IDLE CURRENT ADJUSTMENT

Preparations

1. Place the unit in normal operating condition and avoid excessive ventilation or air circulation.
Adjustment must be performed in the unit circumference temperature $15^{\circ} \sim 30^{\circ}\text{C}$.
2. Set the switches to the following positions.
 - POWER → off
 - VOLUME → $-\infty$ (↶ min.)
 - DIRECT COUPLE → DIRECT
 - SPEAKER → No load (Do not connect speaker or dummy)

Adjustment

1. Remove top cover and rotate VR401, VR402 on the ETC0667 (Power Amplifier Unit) extremely counterclockwise. Connect a DC voltmeter across the test points Rch TP1, 2 and Lch TP3, 4.
2. Plug in the power cord to AC power source (-5% to +5% allowable) and turn on (**ON**) the power switch. Warm up the unit for one minute and adjust the VR401 and VR402 by means of rotating it clockwise and obtain the voltage:—
 $1\text{mV} \pm 0.2\text{mV DC}$ (Pre-adjustment value)
3. 10 ~ 15 minutes later from the pre-adjustment, rotate the VR401, VR402 and adjust the voltage to:—
 $18\text{mV} \pm 2\text{mV DC}$

DISTORTION FACTOR ADJUSTMENT

Adjustment of 20 kHz

1. Connect a 8-ohm loading resistor across the SP terminal.
2. Inject 20 kHz sine wave signal through the TUNER terminal. Operate both R and L channels and obtain 70 watts (23.7 Vrms) across the 8-ohm resistor.
3. Adjust VR403 (Rch) and VR404 (Lch) for minimum distortion.

NEUTRAL POTENTIAL ADJUSTMENT

Preparation

1. Insert the shorting pin into the PHONO input terminal.
2. Connect a digital voltmeter (feasible to measure within the range $0.01\text{mV} \sim 1\text{mV DC}$) to the PHONO output terminal (Rch X, Y and Lch Y, Z).
3. For simplified adjustment connect a 100K-ohm (1/4 watt or so) resistor across the test points (Lch TP-1 and Rch TP-2) on the unit.
4. Set the unit's cartridge switch to MM position and the VOLUME to $-\infty$ (↶ min.) position.

Adjustment

1. Perform the following adjustment about two minutes after turning on (**ON**) the POWER switch.
 - Rotate VR101 (100K-ohm semi-fixed resistor) and adjust the Lch meter reading for 0.5 mV DC or less value.
 - Rotate VR102 (100K-ohm semi-fixed resistor) and adjust the Rch meter reading for 0.5 mV DC or less value.

ETC0667
POWER AMP. UNIT ALIGNMENT POINTS & CONNECTIONS

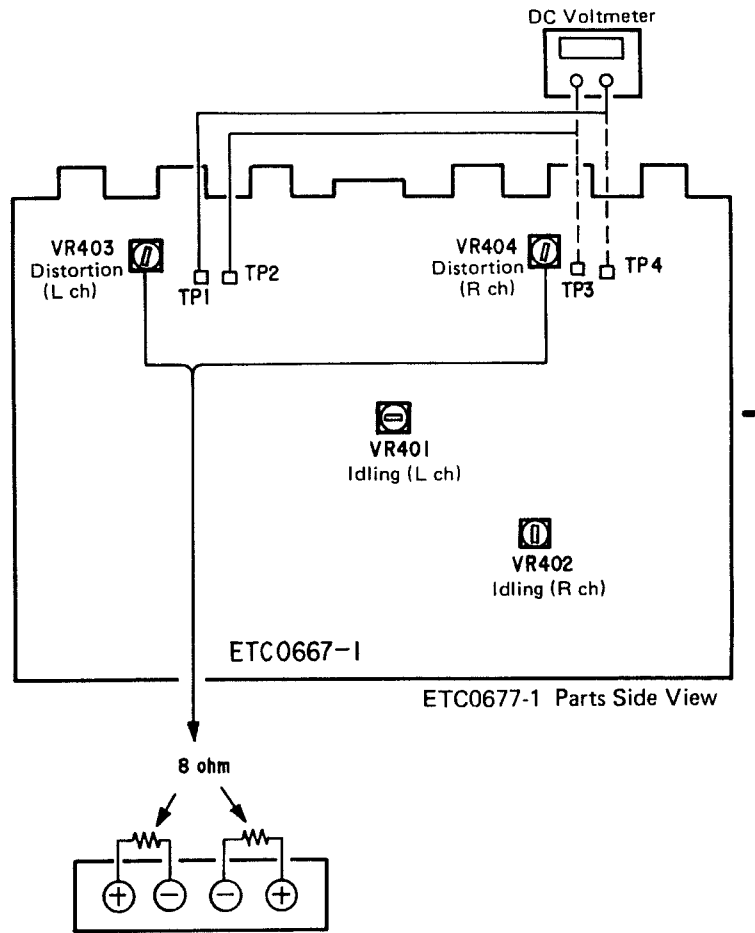


Fig. 3

ETC0668-1
INPUT & EQ. UNIT ALIGNMENT POINTS & CONNECTIONS

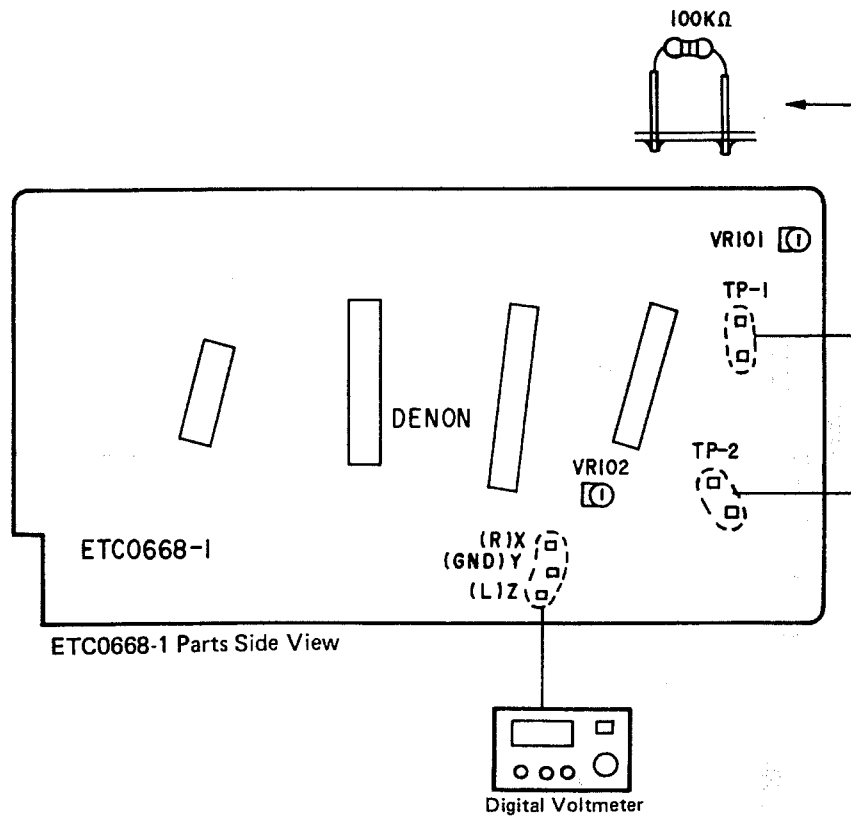


Fig. 4

BLOCK, LEVEL DIAGRAM

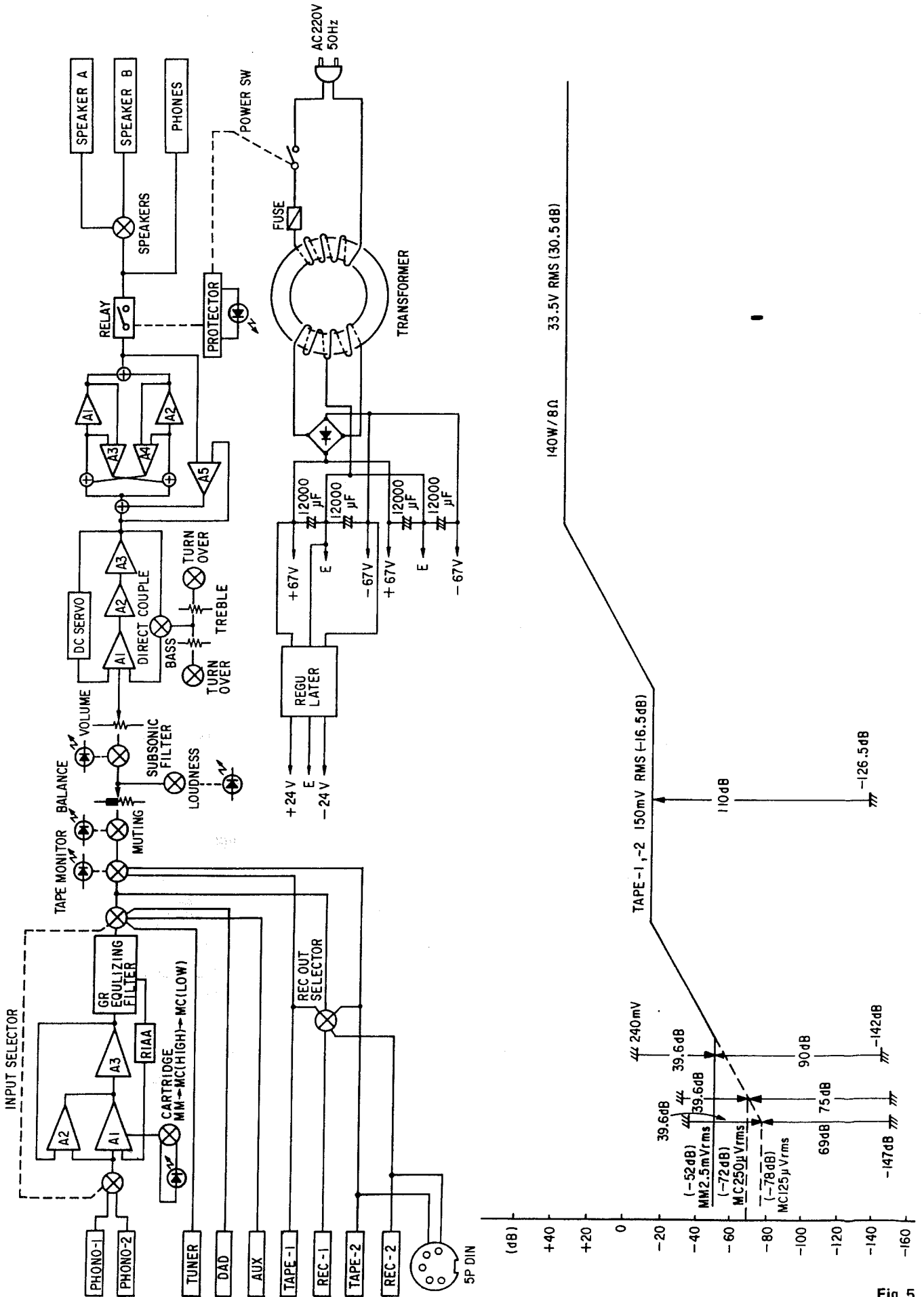
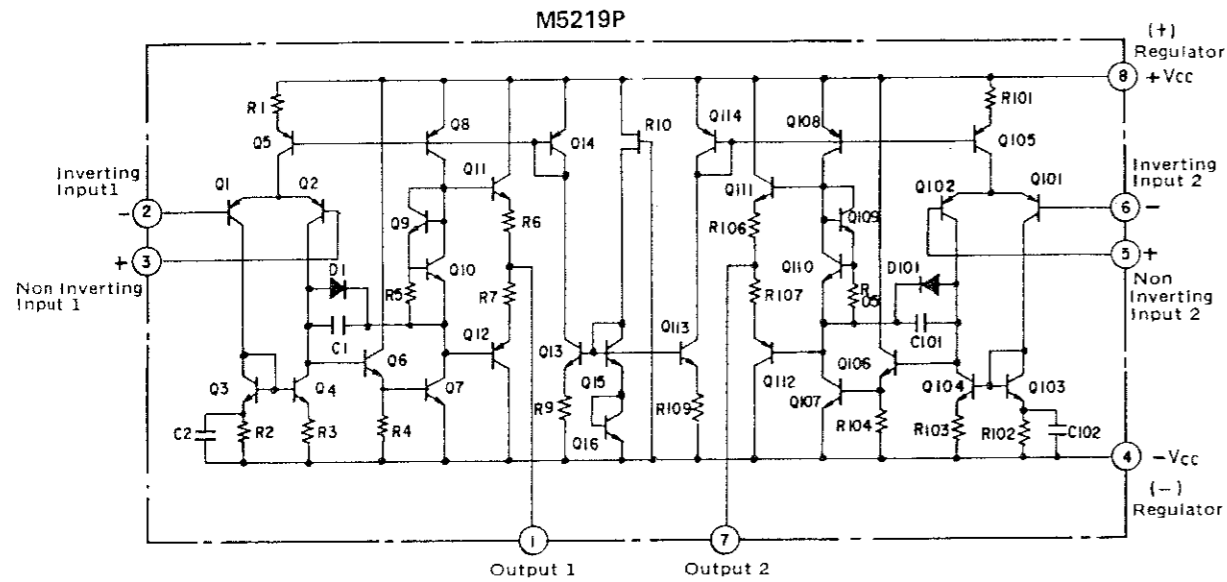
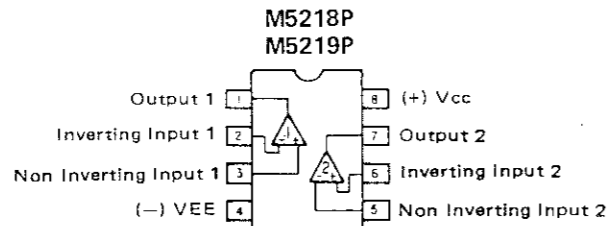
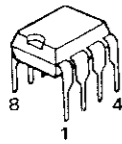


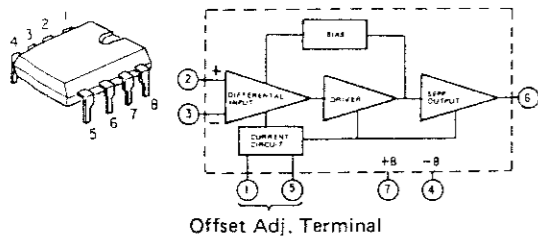
Fig. 5

SEMICONDUCTORS

M5218P
M5219P
(Mitsubishi)



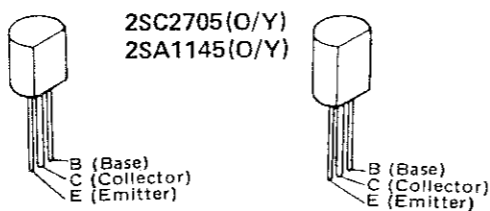
μPC741C (NEC)



• TRANSISTORS (include FET)

2SC1815(BL)
2SC1841(E/F)
2SA1015(Y)

2SC2705(O/Y)
2SA1145(O/Y)



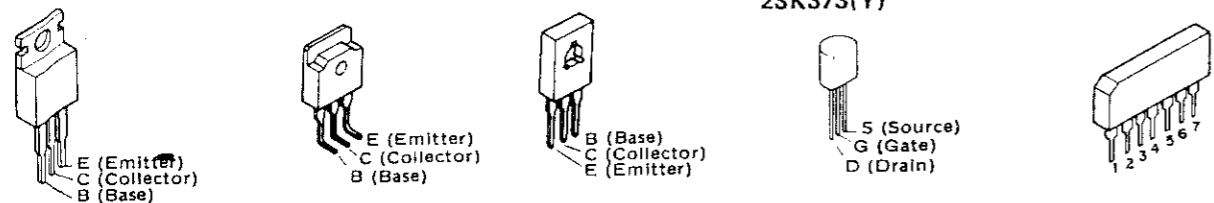
2SC2238(Y)
2SA968(Y)

2SC2581 LB(O)/(Y)
2SA1106 LB(O)/(Y)

2SC2824(Y/O)
2SA1184(Y/O)

FET
2SK369(BL)/(GR)
2SK373(Y)

FET
2SK270A(BL)/(V)



• DIODES (include LED)

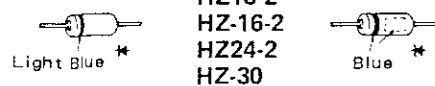
1S2076

HZ7B-3
HZ15-2
HZ16-2
HZ24-2
HZ30

MZ-303A

KB-265

KB-462



STV-1H

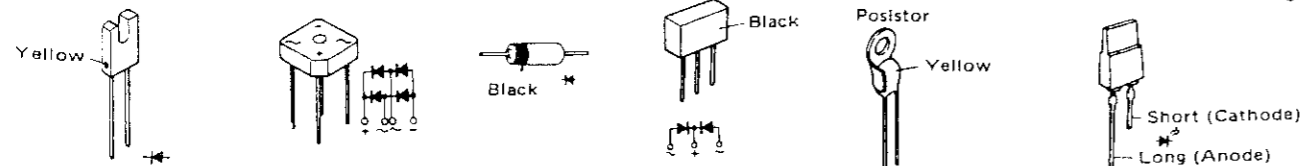
RB-602UFR

W03C

1D2C-1

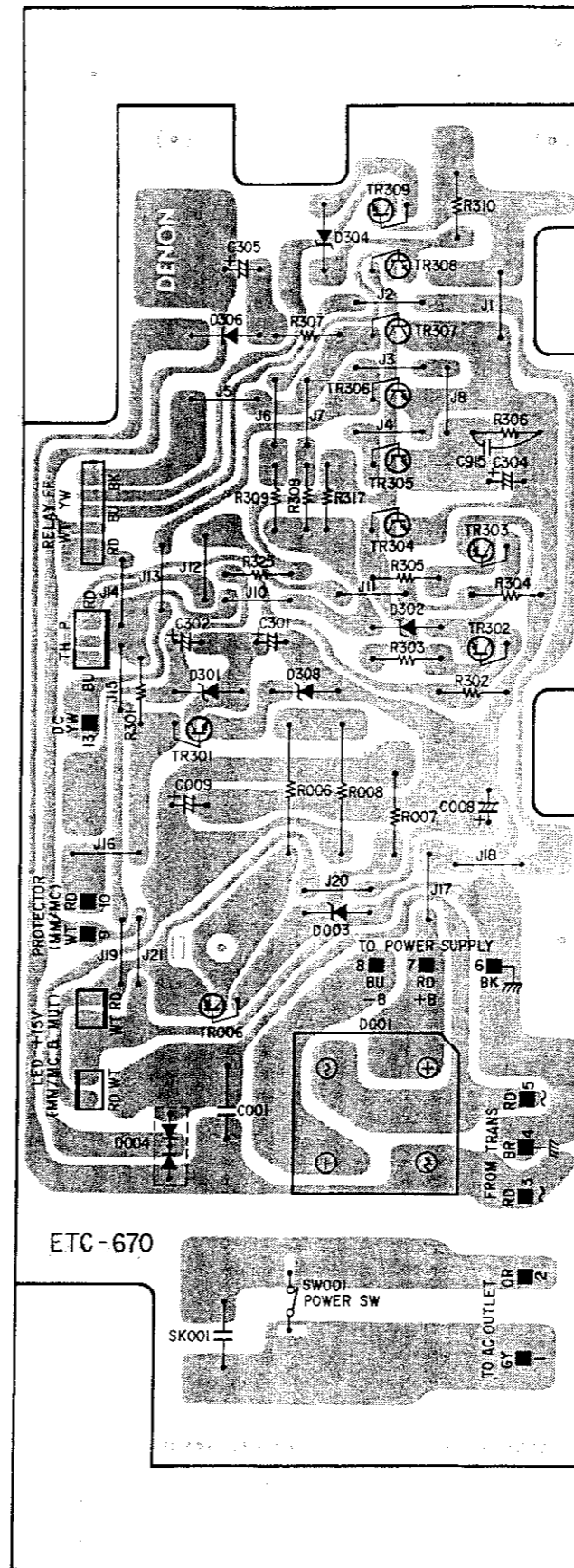
PTH487A01BD222TS

PR5552K-1 Red
AY5552K-1 Orange



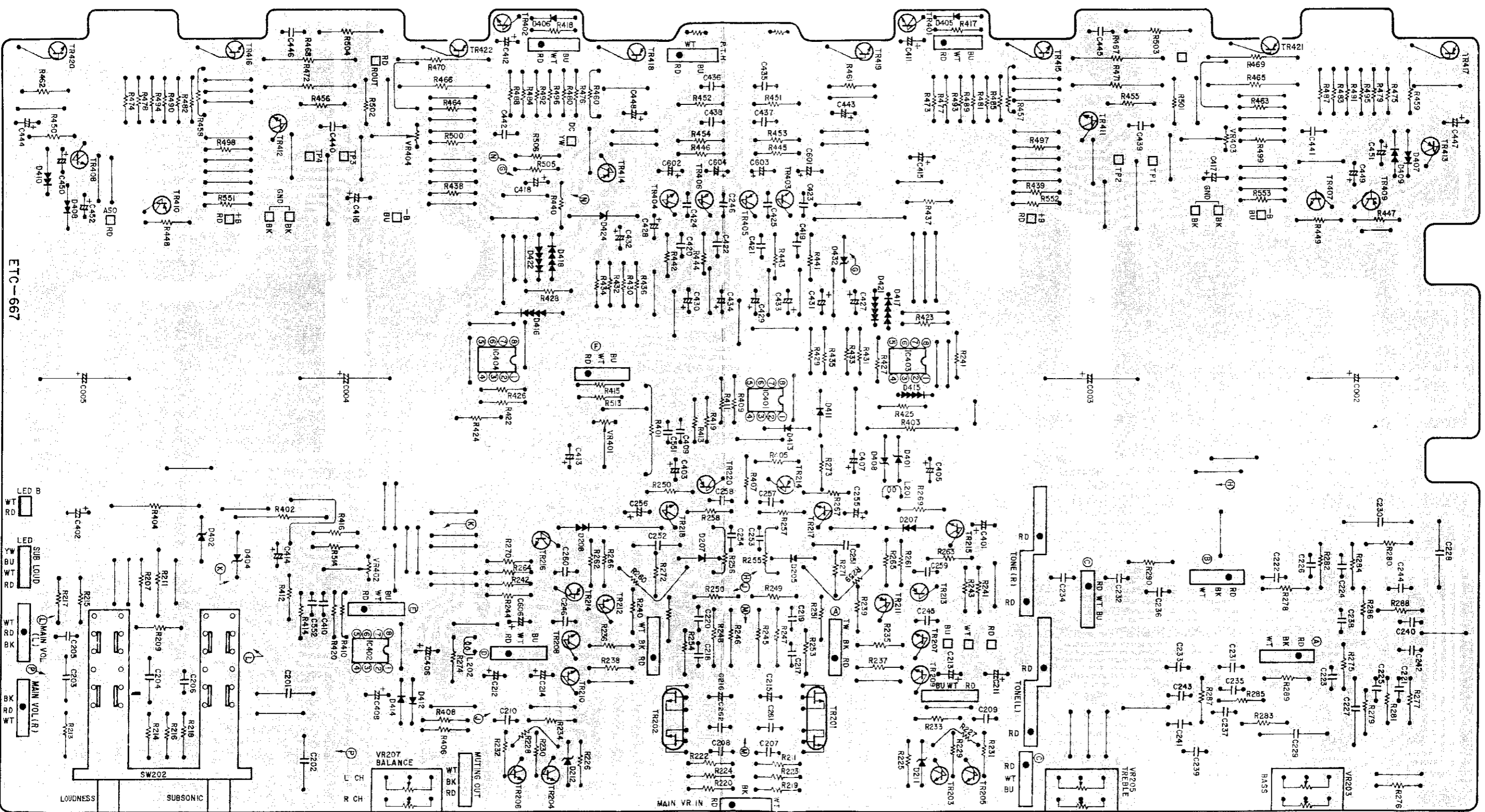
PRINTED WIRING BOARD PATTERNS AND PARTS LIST
ETC0670D RECTIFIER UNIT

ETC0670D RECTIFIER UNIT PARTS LIST



Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
TR006	2730199001	2SC2238(Y)	TRANSISTOR
TR302, 303	2710102005	2SA1015(Y)	TRANSISTOR
TR304 ~306	2730198015	2SC1815(BL)	TRANSISTOR
TR308	2730198015	2SC1815(BL)	TRANSISTOR
TR309	2740060007	2SD667A(C)	TRANSISTOR
D001	2760335000	RB-602UFR	DIODE
D003	2760256008	HZ-16-2	ZENER
D004	2760151006	1D2C-1	DIODE
D302	2760244007	MZ303A	ZENER
D304	2760254000	HZ7B-3	ZENER
D311	2760049008	1S2076	DIODE
RESISTORS			
ΔR006	2440090021	220 ohm ±5%	2W METAL OXIDE (NB)
R007	2410212004	13k ohm ±5%	1/2W CARBON
ΔR008	2440090021	220 ohm ±5%	2W METAL OXIDE (NB)
R302	2412129001	36k ohm ±5%	1/4W CARBON
R303	2412120000	15k ohm ±5%	1/4W CARBON
R304	2412129001	36k ohm ±5%	1/4W CARBON
R305	2412120000	15k ohm ±5%	1/4W CARBON
R306	2412116001	10k ohm ±5%	1/4W CARBON
R309	2412092002	1k ohm ±5%	1/4W CARBON
R310	2412144002	150k ohm ±5%	1/4W CARBON
R317	2412150009	270k ohm ±5%	1/4W CARBON
R325	2412056006	33 ohm ±5%	1/4W CARBON
R326	2412140006	100k ohm ±5%	1/4W CARBON
CAPACITORS			
C001	2561017019	0.01μF ±10%	630V METALIZED
C008	2544089006	1μF ±20%	50V ELECTROLYTIC
C009	2544063035	100μF ±20%	80V ELECTROLYTIC
C301	2549015004	22μF ±10%	10V ELECTROLYTIC
C304	2544161034	330μF ±20%	6.3V ELECTROLYTIC
C915	2533643000	470pF ±5%	50V CERAMIC
SK001	2538003014	4700pF ±20%	400V CERAMIC
SWITCH			
SW001	2124405013	PUSH SWITCH	
OTHER PARTS			
R554, 555	2221015306	P.W. BOARD	
	2090008120	JUMPER WIRE P=10mm USED 15	
	2090051009	0 ohm JUMPER TAPE USED 2	
	EP-5667H1	TERMINAL PIN USED 12	
	4170140207	RADIATOR	
	4730354019	TAPPING SCREW (2) 3x8 USED 2	
	2038123009	5P CONNECTOR CORD	
	2050185054	5P WIRE HOLDER	
	2050190023	2PNH CONNECTOR BASE USED 2	
	2050190036	3PNH CONNECTOR BASE	

ETC0667 TONE & POWER UNIT



ETC-667

ETC0667D TONE & POWER UNIT PARTS LIST

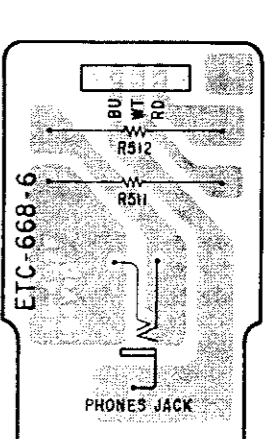
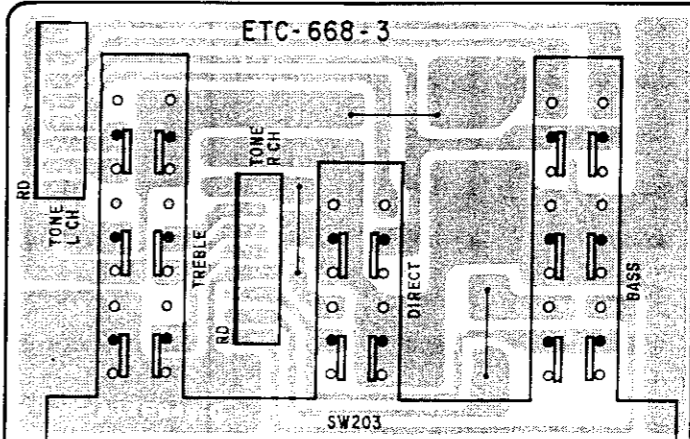
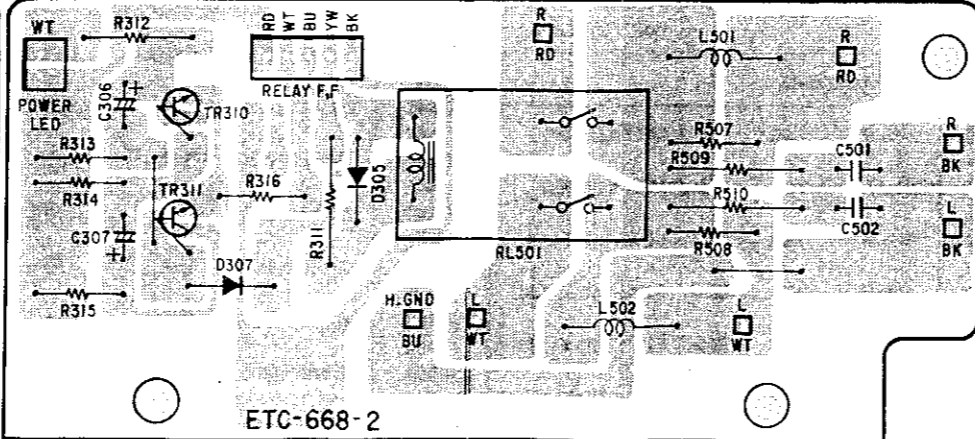
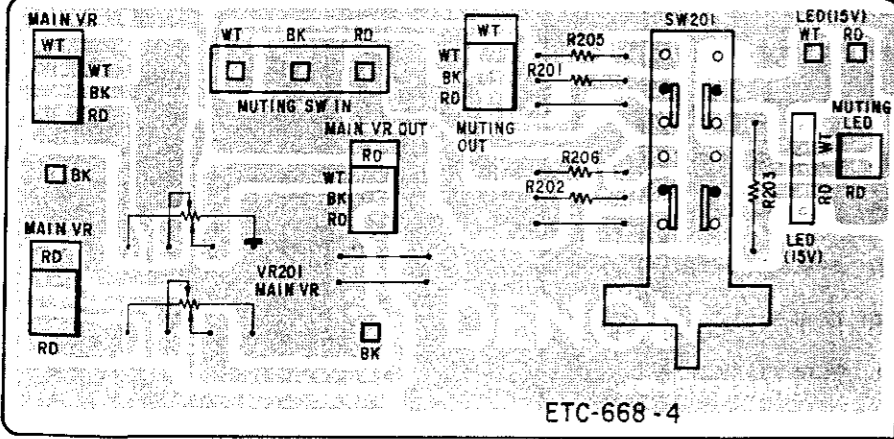
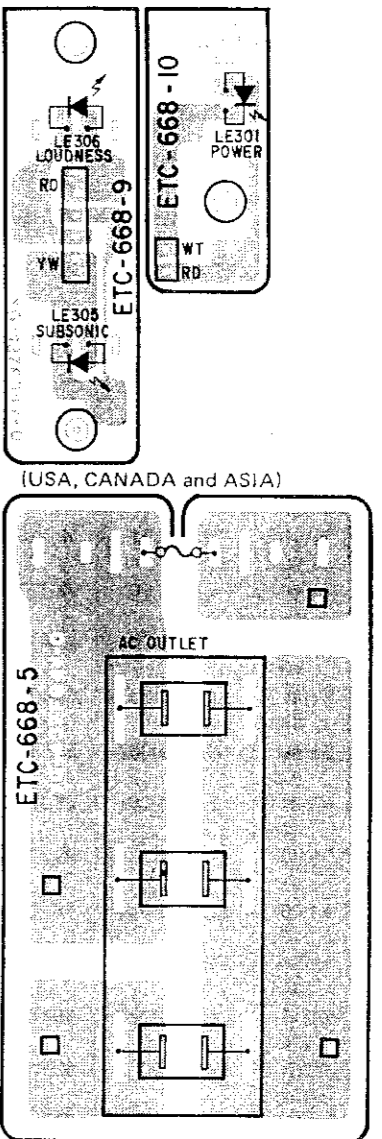
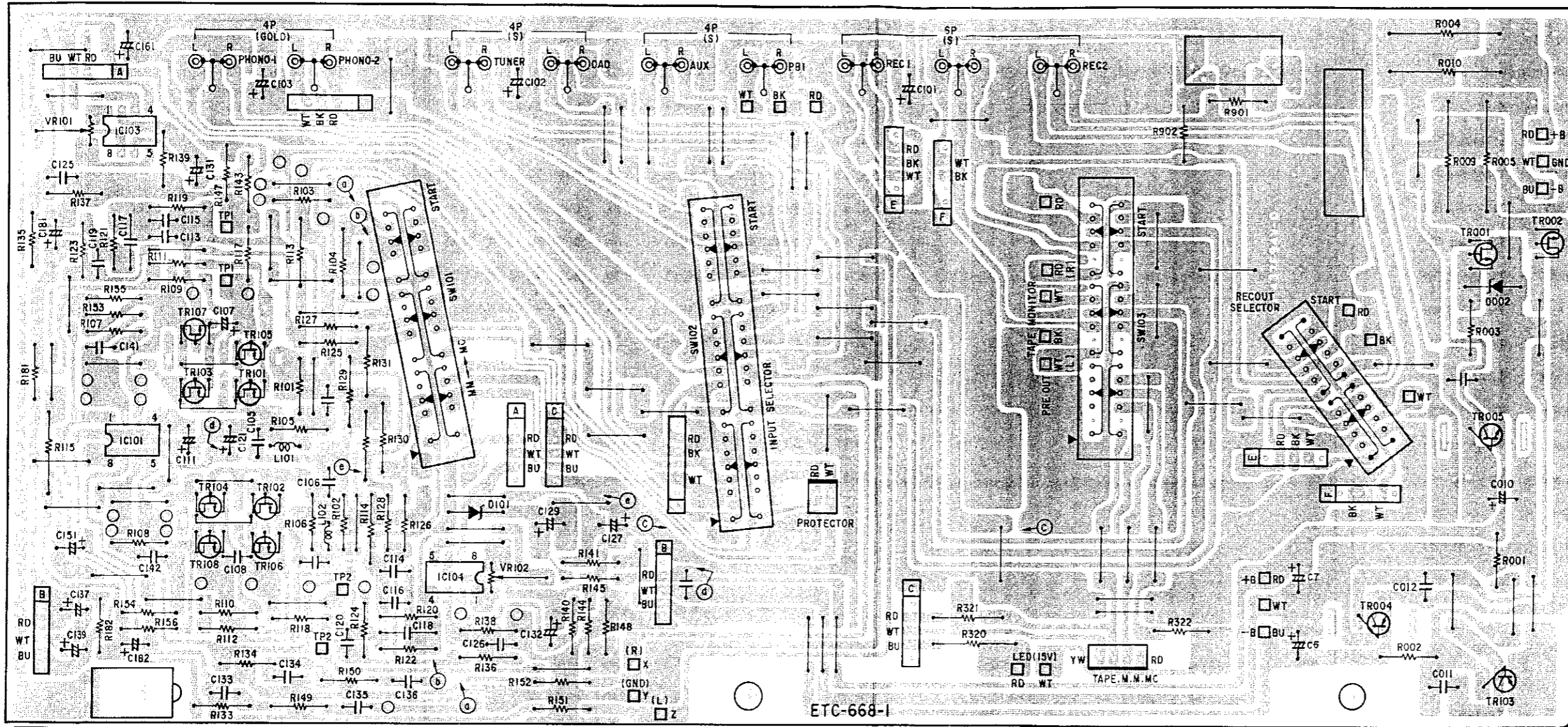
Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
IC401 ~404	2630257001	M5218P (MITSUBISHI) IC
TR201, 202	2750036021	2SK270A(BL)/(V) FET
TR203 ~206	2730198015	2SC1815(BL) TRANSISTOR
TR207 ~210	2730235020	2SC1841(E/F) TRANSISTOR
TR211 ~214	2710168007	2SA1145(O/Y) TRANSISTOR
TR215, 216	2730199001	2SC2238(Y) TRANSISTOR
TR217, 218	2730281003	2SC2705(O/Y) TRANSISTOR
TR219, 220	2710104003	2SA968(Y) TRANSISTOR
TR401, 402	2730198015	2SC1815(BL) TRANSISTOR
TR403, 404	2730281003	2SC2705(O/Y) TRANSISTOR
TR405, 406	2710168007	2SA1145(O/Y) TRANSISTOR
TR407, 408	2730281003	2SC2705(O/Y) TRANSISTOR
TR409, 410	2710168007	2SA1145(O/Y) TRANSISTOR
TR411, 412	2730199001	2SC2238(Y) TRANSISTOR
TR413, 414	2710104003	2SA968(Y) TRANSISTOR
D205, 206	2760049008	1S2076 DIODE
D207, 208	2760216019	KB-265 DIODE
D211, 212	2760244007	MZ303A ZENER
D401 ~404	2760253001	MZ15-2 ZENER
D405, 406	2760334001	STV-1H ZENER
D407 ~410	2760216019	KB-265 ZENER
D411 ~414	2760049008	1S2076 ZENER
D415 ~422	2760337008	KB462 ZENER
D423 ~426	2760254000	HZ7B-3 ZENER
D427, 428	2760337008	KB-462 DIODE
D429, 430	2760049008	1S2076 DIODE
D431 ~434	2760057003	V06B DIODE
RESISTORS (not included Carbon Film ±5%, 1/4W Type)		
R215, 216	2420203003	10M ohm ±10% 1/4W CARBON COMPOSIT
AR229 ~232	2412370025	7.5k ohm ±5% 1/4W CARBON (NB)
AR239, 240	2412321029	1.5k ohm ±5% 1/4W CARBON (NB)
AR241 ~244	2412321003	1k ohm ±5% 1/4W CARBON (NB)
R245, 246	2410169005	220 ohm ±5% 1/2W CARBON COMPOSIT

Ref. No.	Part No.	Part Name & Descriptions
R247, 248	2410204009	6.2k ohm ±5% 1/2W CARBON COMPOSIT
AR255 ~258	2412370009	180 ohm ±5% 1/4W CARBON (NB)
AR259, 260	2440053026	10k ohm ±5% 1W METAL OXIDE (NB)
AR263, 264	2412321045	220 ohm ±5% 1/4W CARBON (NB)
AR267 ~270	2412321016	22 ohm ±5% 1/4W CARBON (NB)
AR401 ~404	2440106025	4.7k ohm ±5% 2W METAL OXIDE (NB)
AR405, 406	2412314007	100 ohm ±5% 1/4W CARBON (NB)
AR409 ~414	2412369078	4.7k ohm ±5% 1/4W CARBON (NB)
AR419, 420	2412369078	4.7k ohm ±5% 1/4W CARBON (NB)
AR441 ~446	2412321003	1k ohm ±5% 1/4W CARBON (NB)
AR451 ~456	2412314007	100 ohm ±5% 1/4W CARBON (NB)
AR467 ~464	2412321032	4.7 ohm ±5% 1/4W CARBON (NB)
AR466 ~472	2442029003	0.22 ohm ±5% 2W METAL OXIDE (NB)
AR473 ~496	2412321016	22 ohm ±5% 1/4W CARBON (NB)
AR501, 502	2412314007	100 ohm ±5% 1/4W CARBON (NB)
AR503, 504	2440025025	47 ohm ±5% 1W METAL OXIDE (NB)
AR521, 522	2412369052	2.2k ohm ±5% 1/4W CARBON (NB)
VR203	2110309110	VARIABLE RESISTOR 100k ohm (BASS)
VR205	2110309107	VARIABLE RESISTOR 50k ohm (TREBLE)
VR207	2110406000	VARIABLE RESISTOR 100k ohm (BALANCE)
VR401, 402	2116025058	SEMI FIXED RESISTOR 10k ohm (IDLING)
VR403, 404	2116025016	SEMI FIXED RESISTOR 100 ohm (DISTORTION)
CAPACITORS		
C201, 202	2561030067	0.18μF ±5% 100V METALIZED
C203, 204	2561030070	0.1μF ±5% 100V METALIZED
C205, 206	2554142001	750pF ±5% 50V PLASTIC FILM
C207, 208	2554131009	270pF ±5% 50V PLASTIC FILM
C209, 210	2554145008	0.001μF ±5% 50V PLASTIC FILM
C211 ~214	2544181001	1μF ±20% 50V ELECTROLYTIC
C215, 216	2543016083	22μF ±20% 50V ELECTROLYTIC (B.P)
C217, 218	2521003005	3pF ±0.25pF 50V MICA
C219, 220	2521008000	8pF ±0.5pF 50V MICA
C221, 222	2554131009	270pF ±5% 50V PLASTIC FILM
C223 ~226	2554183002	0.039μF ±5% 50V PLASTIC FILM

Ref. No.	Part No.	Part Name & Descriptions
C227 ~230	2561030041	0.27μF ±5% 100V METALIZED
C231 ~234	2554159007	0.0039μF ±5% 50V PLASTIC FILM
C235, 236	2554127000	180pF ±5% 50V PLASTIC FILM
C237, 238	2554147006	0.0012μF ±5% 50V PLASTIC FILM
C239, 240	2554181004	0.033μF ±5% 50V PLASTIC FILM
C241, 242	2554157009	0.0033μF ±5% 50V PLASTIC FILM
C243, 244	2554177005	0.022μF ±5% 50V PLASTIC FILM
C245, 246	2554127000	180pF ±5% 50V PLASTIC FILM
C251, 252	2554079048	0.01μF ±5% 100V PLASTIC FILM
C253, 254	2554145008	0.001μF ±5% 50V PLASTIC FILM
C255, 256	2544181001	1μF ±20% 100V ELECTROLYTIC
C257, 258	2554137003	470pF ±5% 50V PLASTIC FILM
C259, 260	2521081027	3pF ±0.5pF 500V MICA
C261, 262	2554121006	100pF ±5% 50V PLASTIC FILM
C401 ~408	2544181001	1μF ±20% 100V ELECTROLYTIC
C405 ~418	2544089002	100μF ±20% 50V ELECTROLYTIC
C419 ~422	2554137003	470pF ±5% 50V PLASTIC FILM
C423 ~426	2521079084	33pF ±10% 500V MICA
C427 ~434	2544181001	1μF ±20% 50V ELECTROLYTIC
C435 ~442	2554169000	0.01μF ±5% 50V PLASTIC FILM
C443, 444	2554181001	1μF ±20% 100V ELECTROLYTIC
C445, 446	2554169000	0.01μF ±5% 50V ELECTROLYTIC
C447, 448	2544181001	1μF ±20% 100V ELECTROLYTIC
C449 ~452	2544089006	1μF ±20% 50V ELECTROLYTIC
C461, 462	2533619005	47pF ±5% 50V CERAMIC
C551, 552	2554137003	470pF ±5% 50V PLASTIC FILM
C601 ~604	2544181001	1μF ±20% 100V ELECTROLYTIC
C603, 604	2544181001	1μF ±20% 100V ELECTROLYTIC
C606	2544181001	1μF ±20% 100V ELECTROLYTIC
COIL, SWITCH		
L201, 202	2350008006	INDUCTOR 22μH
SW202	2124461002	2P PUSH SWITCH

Ref. No.	Part No.	Part Name & Descriptions
OTHER PARTS		
R552, 553	2221014307	P.W. BOARD
	2090008146	JUMPER WIRE P=5mm USED 1
	2090008120	JUMPER WIRE P=10mm USED 99
	2090008104	JUMPER WIRE P=15mm USED 6
	2090008162	JUMPER WIRE P=20mm USED 1
	2090051009	0 ohm JUMPER TAPE USED 2
	EP-5667H1	TERMINAL PIN USED 20
	2050185038	3P WIRE HOLDER USED 17
	2050185041	4P WIRE HOLDER USED 4
	2050190023	2PNH CONNECTOR BASE
2050190049	4PNH CONNECTOR BASE	
2034203059	3P CONNECTOR CORD	
2034215005	3P CONNECTOR CORD	
2034215018	3P CONNECTOR CORD	
2034215021	3P CONNECTOR CORD	
2034215034	3P CONNECTOR CORD	
2042048031	8P CONNECTOR CORD USED 2	

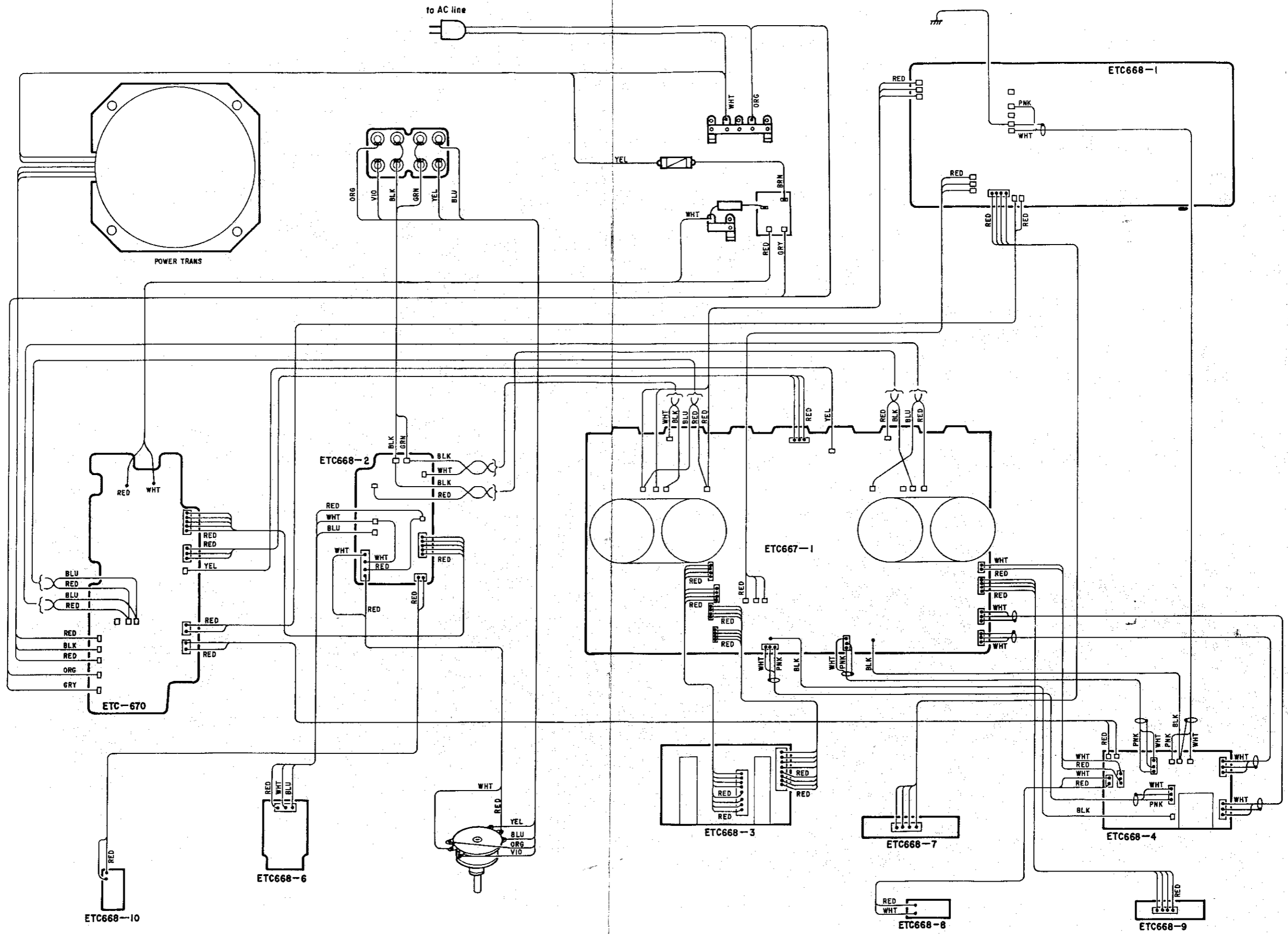
ETC0668 INPUT & EQ. UNIT



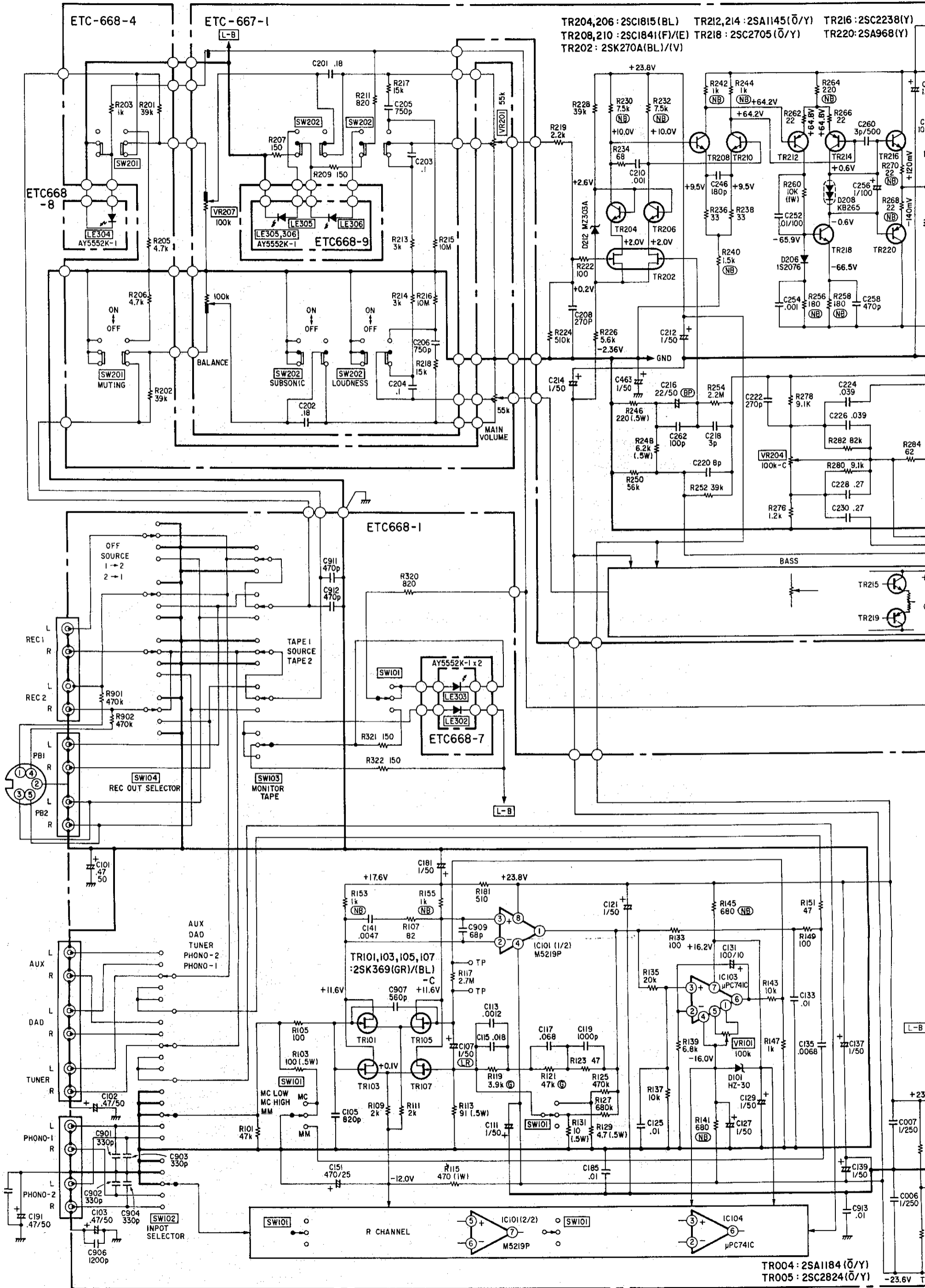
ETC0668D INPUT & EQ. UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS								
IC101	2630284003	M5219P (MITSUBISHI) IC	C105	2554143000	820pF ±5% 50V MICA	OTHER PARTS 2221013308 P.W. BOARD EP-5667H1 TERMINAL PIN USED 41 2090008120 JUMPER WIRE P=10mm USED 79 4410412200 LED HOLDER USED 6 1220109007 BLIND SHEET USED 6 4170043100 RADIATOR USED 2 4730354019 TAPPING SCREW (2) 3x8 USED 2 2048100009 HEAD PHONE JACK 2050185038 3P WIRE HOLDER USED 13 2050185041 4P WIRE HOLDER USED 2 2050190023 2PNH CONNECTOR BASE USED 2 2050190036 3PNH CONNECTOR BASE USED 4 2050190049 4PNH CONNECTOR BASE 2050190052 5PNH CONNECTOR BASE 2050190081 8PNH CONNECTOR BASE USED 2 2050154043 4PNH CONNECTOR BASE 2048059008 DIN JACK (5P) 2050145007 4P CONNECTOR BASE 2036084001 4P CONNECTOR BASE USED 2 2040079002 6P CONNECTOR BASE 4140292004 SHIELD COVER (C) 4140240001 EARTH PLATE 4140116106 SHIELD COVER USED 2 2032136034 2P CONNECTOR CORD 2032115042 2P CONNECTOR CORD 2032136047 2P CONNECTOR CORD 2036105090 4P CONNECTOR CORD EP-5667H2 TERMINAL USED 4 2050003107 3T LUG		
IC103, 104	2630133002	μPC741 (NEC) IC	C106	2554143000	820pF ±5% 50V PLASTIC FILM			
TR001, 002	2750042002	2SK373(Y) FET	C107, 108	2549011008	1μF 50V ELECTROLYTIC			
TR003	2710102005	2SA1015(Y) TRANSISTOR	C111	2544146004	1μF ±20% 50V ELECTROLYTIC			
TR004	2710135027	2SA1184(Y/O) TRANSISTOR	C113, 114	2544147006	0.0012μF ±5% 50V PLASTIC FILM			
TR005	2730236029	2SC2824(Y/O) TRANSISTOR	C115	2554175007	0.018μF ±5% 50V PLASTIC FILM			
TR101	2750038045	2SK369(BL)/(GR)-C FET	C117, 118	2554189006	0.068μF ±5% 50V PLASTIC FILM			
TR310, 311	2730198015	2SC1815(BL) TRANSISTOR	C119, 120	2554145008	0.001μF ±5% 50V PLASTIC FILM			
D002	2760220034	HZ24-3 ZENER	C121	2544146004	1μF ±20% 50V ELECTROLYTIC			
D101	2760224001	HZ-30 ZENER	C125, 126	2554169000	0.01μF ±5% 50V PLASTIC FILM			
D305	2760191008	W03C DIODE	C127	2544146004	1μF ±20% 50V ELECTROLYTIC			
D307	2760191008	W03C DIODE	C129	2544146004	1μF ±20% 50V ELECTROLYTIC			
LE301	3939154008	PR5552K-1 RED LED	C131, 132	2544130007	100μF ±20% 10V ELECTROLYTIC			
LE302	3939262000	AY5552K-1M(A/M/Y) ORANGE LED	C133, 134	2554169000	0.01μF ±5% 50V PLASTIC FILM			
~306			C135, 136	2554165004	0.0068μF ±5% 50V PLASTIC FILM			
RESISTORS (not included Carbon ±5%, 1/4W Type)			C137	2544146004	1μF ±20% 50V ELECTROLYTIC			
R004, 005	2440098023	1k ohm ±5% 2W METAL OXIDE (NB)	C139	2544146004	1μF ±20% 50V ELECTROLYTIC			
R009, 010	2440098023	1k ohm ±5% 2W METAL OXIDE (NB)	C141, 142	2554161008	0.0047μF ±5% 50V PLASTIC FILM			
R103, 104	2410161003	100 ohm ±5% 1/2W CARBON	C151	2544157006	470μF ±20% 25V ELECTROLYTIC			
R113, 114	2410160004	91 ohm ±5% 1/2W CARBON	C181, 182	2544146004	1μF ±20% 50V ELECTROLYTIC			
R115	2440037026	470 ohm ±5% 1W METAL OXIDE (NB)	C185	2531024003	0.01μF +80,-20% 50V CERAMIC			
R119, 120	2412318003	3.9k ohm ±2% 1/4W CARBON	C191	2544145005	0.47μF ±20% 50V ELECTROLYTIC			
R121, 122	2412318016	47k ohm ±2% 1/4W CARBON	C306, 307	2544147003	2.2μF ±20% 50V ELECTROLYTIC			
R129, 130	2410129003	4.7 ohm ±5% 1/2W CARBON	C501, 502	2554177005	0.022μF ±5% 50V PLASTIC FILM			
R131, 132	2410137008	10 ohm ±5% 1/2W CARBON	C901	2533639001	330pF ±5% 50V CERAMIC			
R141	2412321090	680 ohm ±5% 1/4W CARBON (NB)	~904					
R146	2412321090	680 ohm ±5% 1/4W CARBON (NB)	C905, 906	2554147006	0.0012μF ±5% 50V PLASTIC FILM			
R153	2412321003	1k ohm ±5% 1/4W CARBON (NB)	C907, 908	2533645008	560pF ±5% 50V CERAMIC			
R311	2440041026	1k ohm ±5% 1W METAL OXIDE (NB)	C909, 910	2533623004	68pF ±5% 50V CERAMIC			
R312	2410185005	1k ohm ±5% 1/2W CARBON	C911, 912	2533643000	470pF ±5% 50V CERAMIC			
R509, 510	2440021029	22 ohm ±5% 1W METAL OXIDE (NB)	C913	2531024003	0.01μF +80,-20% 50V CERAMIC			
R511, 512	2440087021	120 ohm ±5% 2W METAL OXIDE (NB)	SWITCHES					
VR101, 102	2116025032	SEMI FIXED RESISTOR 100k ohm OFFSET	SW101	2124465008	SLIDE SW (6-4) REMOTE MM-MC			
VR201	2110405001	VARIABLE RESISTOR 55k ohm MAIN	SW102	2124496006	SLIDE SW (6-6) REMOTE INPUT SEL			
CAPACITORS			SW103	2124466007	SLIDE SW (6-4) REMOTE TAPE MONI			
C006, 007	2561018005	1μF ±10% 250V METALIZED	SW104	2124187001	SLIDE SW (4-4) REMOTE REC OUT			
C010	2544166000	220μF ±20% 50V ELECTROLYTIC	SW201	2124462001	1P PUSH SWITCH MUTING			
C011	2521026008	47pF ±5% 50V MICA	SW203	2124463000	3P PUSH SWITCH DIRECT & T. OVER			
C012	2554133007	330pF ±5% 50V PLASTIC FILM	COIL, RELAY					
C101	2544145005	0.47μF ±20% 50V ELECTROLYTIC	L501, 502	2350007007	INDUCTOR 1mH			
~103			RL501	2140037009	RELAY			

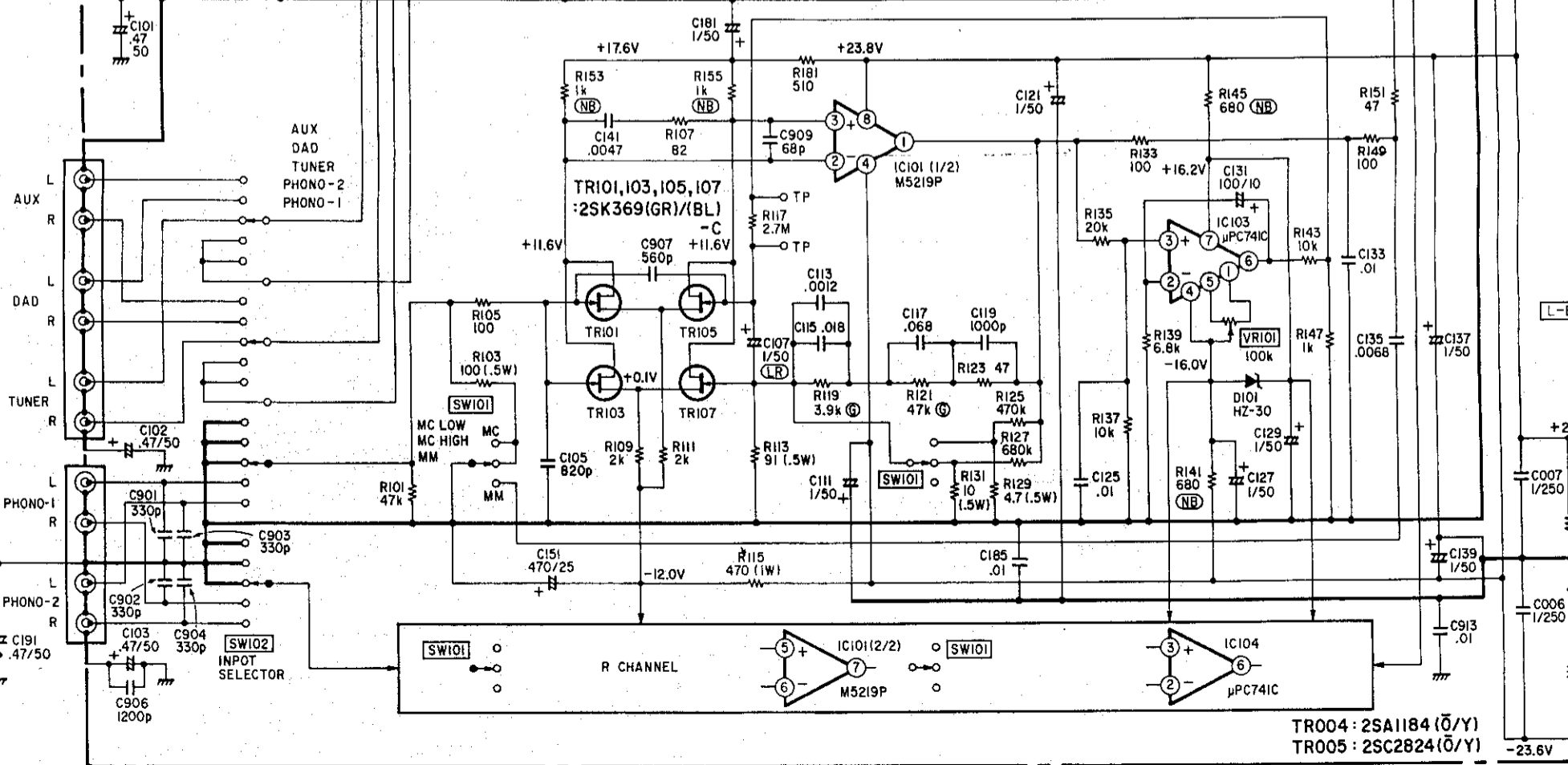
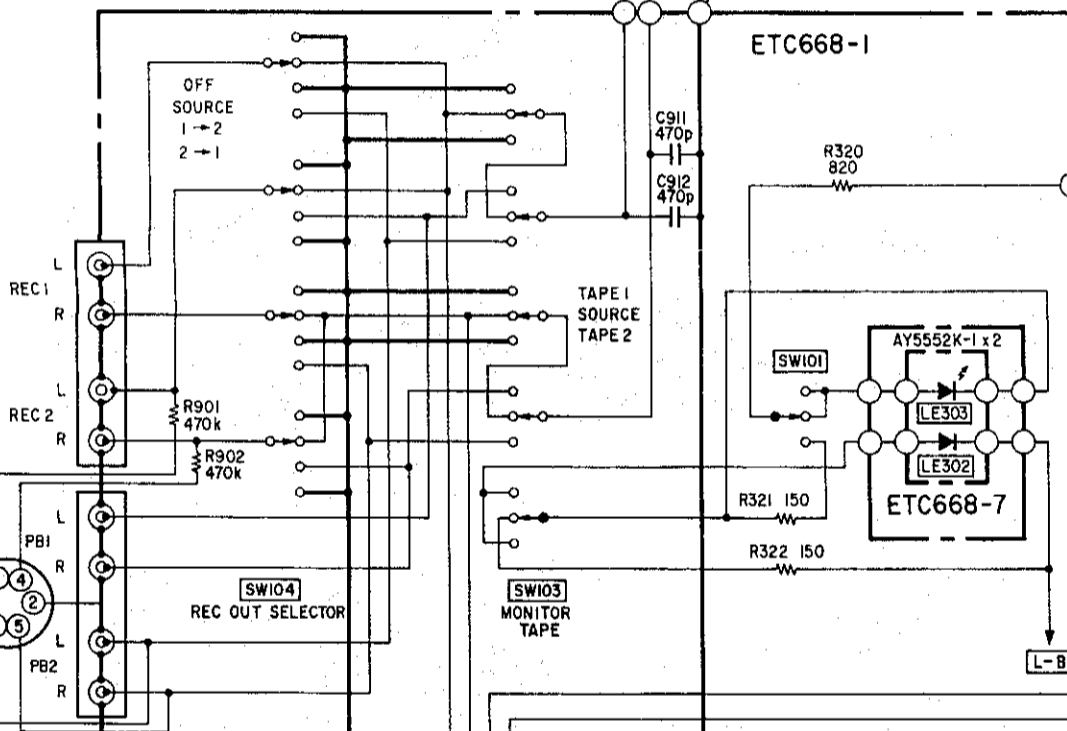
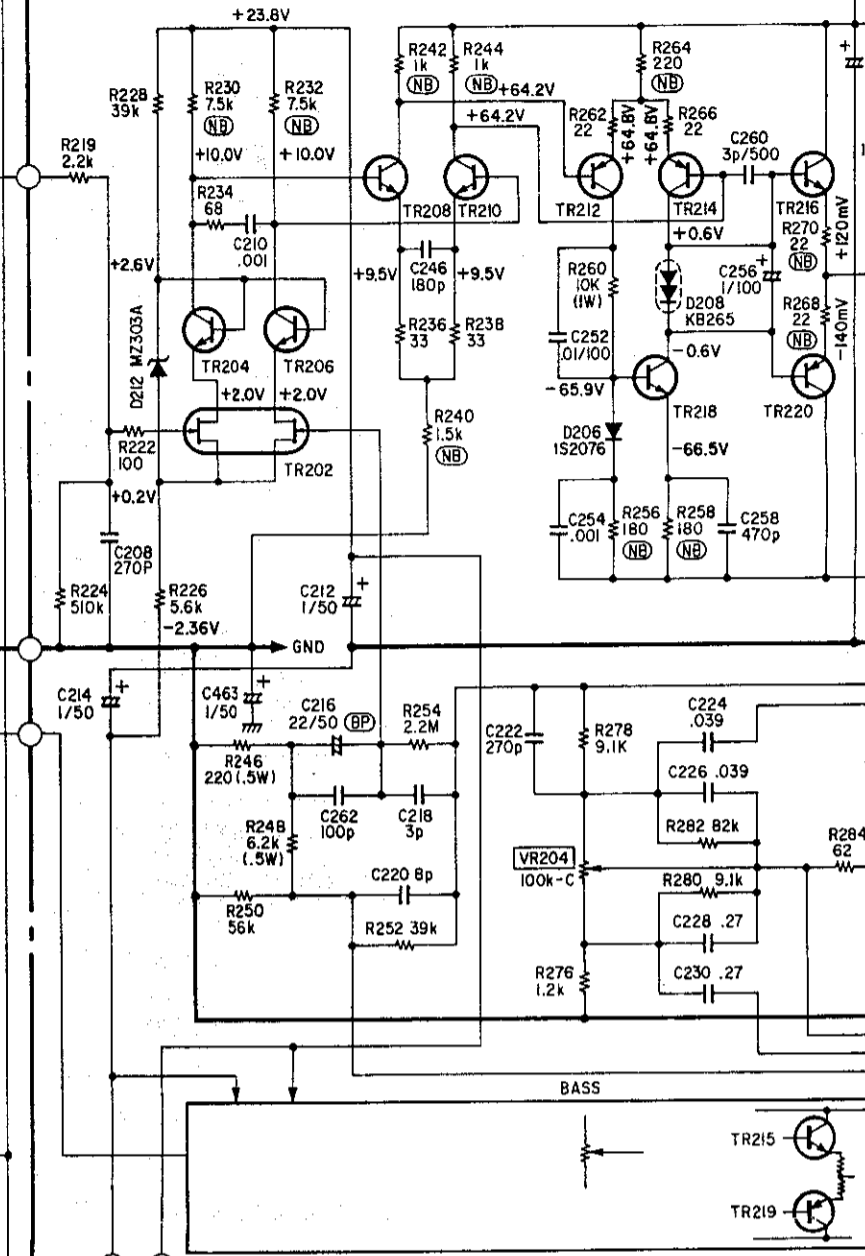
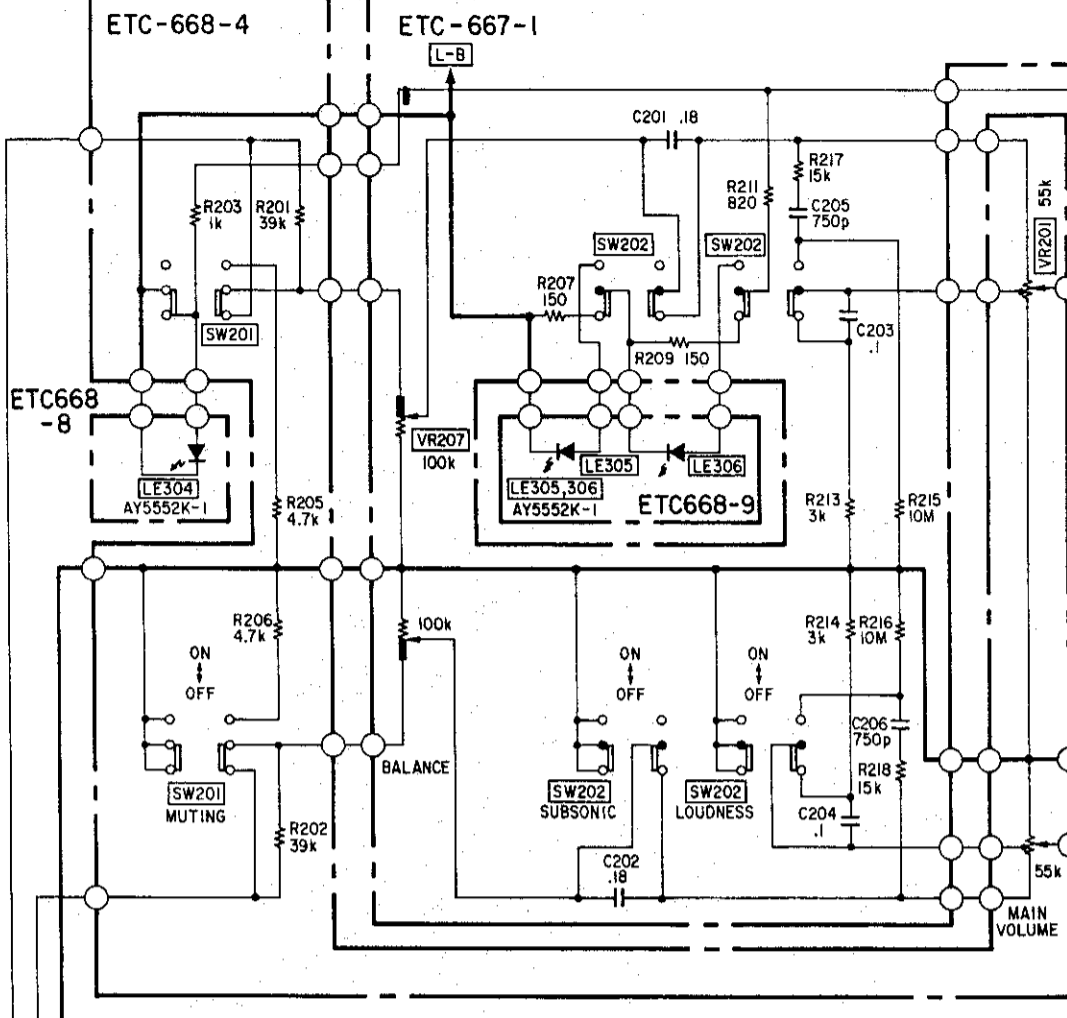
CONNECTION DIAGRAM



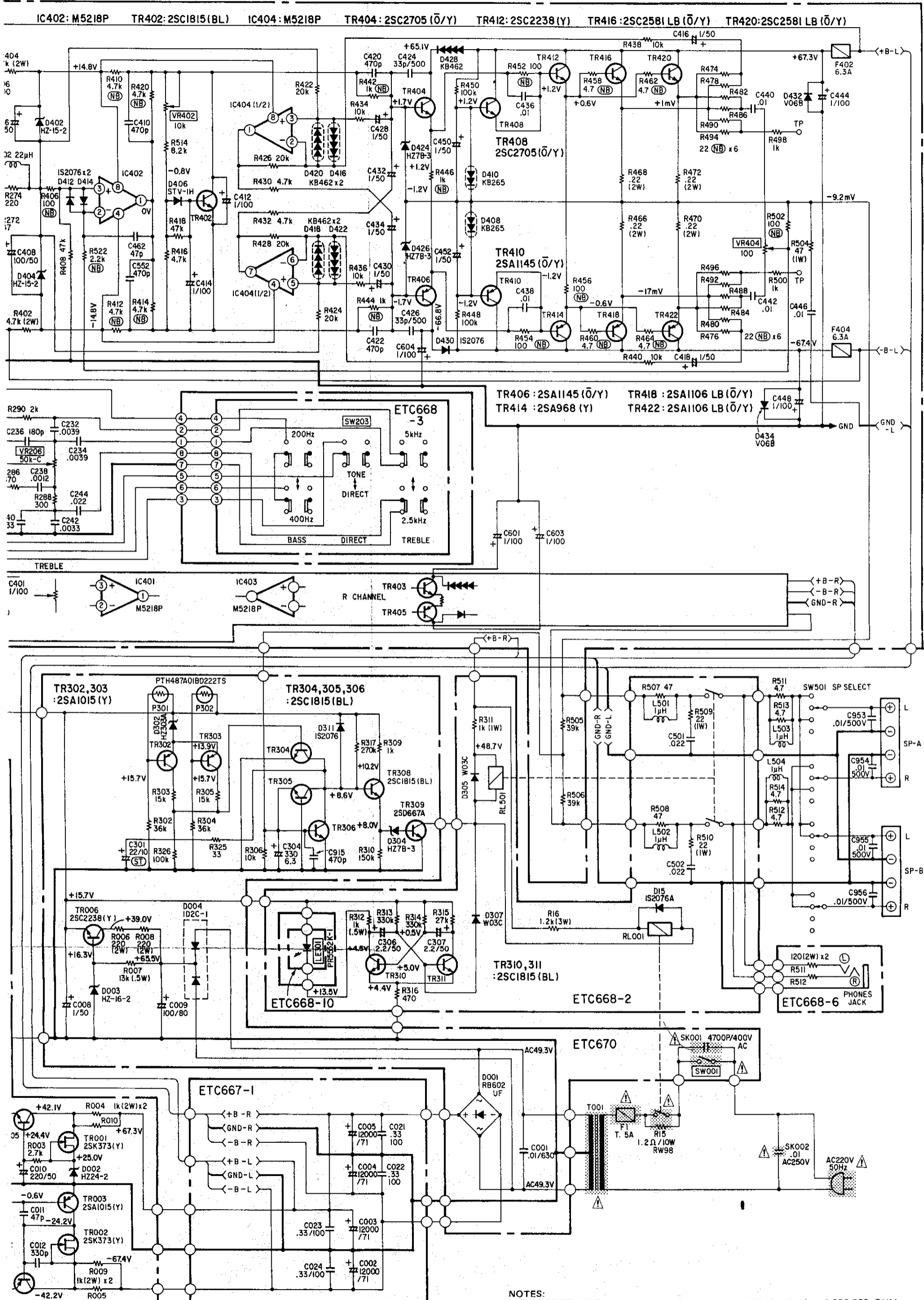
WIRING DIAGRAM



ETC-668-4 ETC-667-1 TR204,206: 2SC1815 (BL) TR212,214: 2SA1145 (O/Y) TR216: 2SC2238(Y)
TR208,210: 2SC1841(F)/(E) TR218: 2SC2705 (O/Y) TR220: 2SA968(Y)
TR202: 2SK270A(BL)/(V)

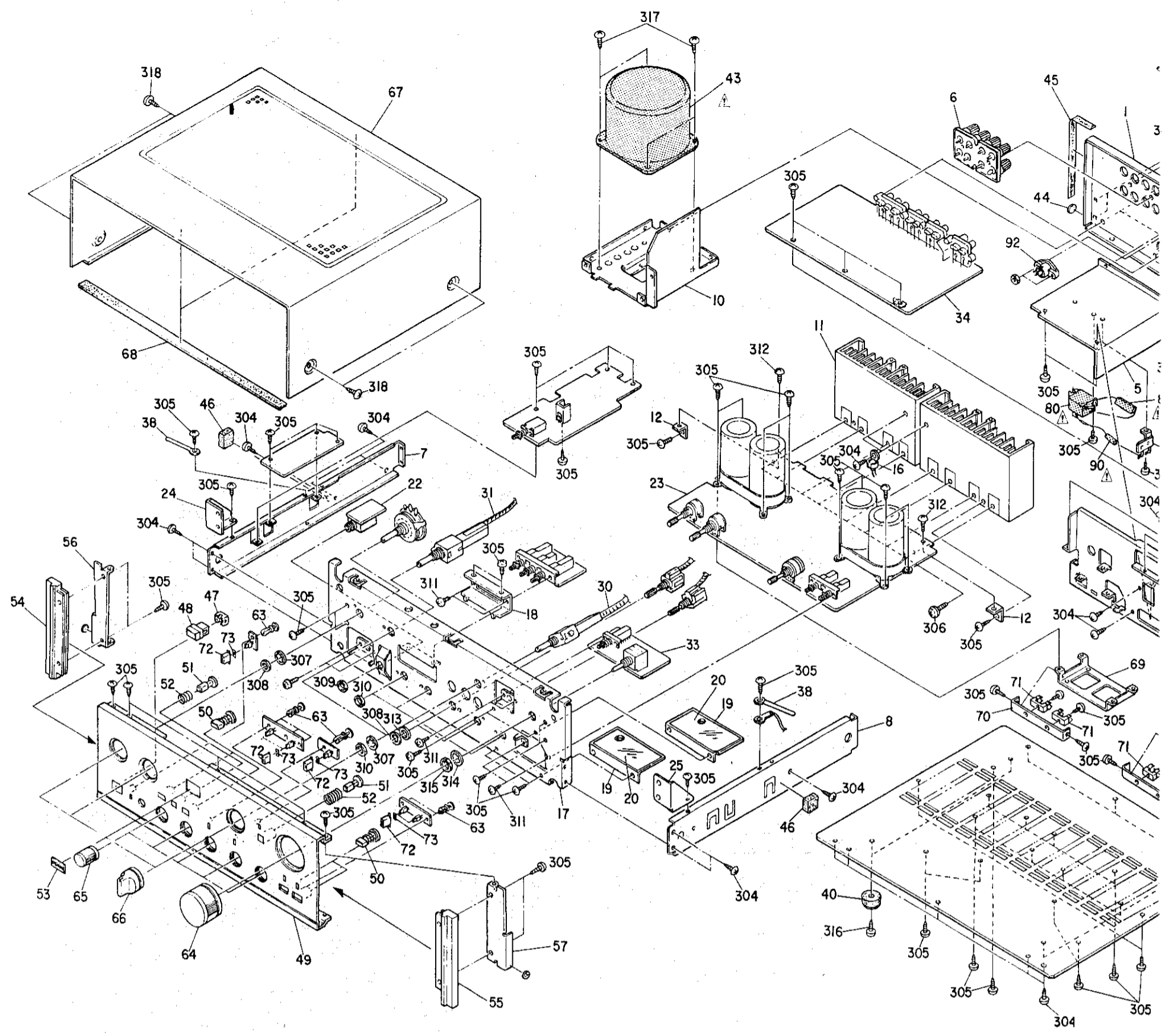


⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



NOTES:
 ALL RESISTANCE VALUES IN OHM, K = 1,000 OHM, M = 1,000,000 OHM.
 ALL CAPACITANCE VALUES IN MICROFARAD, P = MICRO-MICRO FARAD.
 EVERY VOLTAGES AND CURRENTS IS MEASURED AT NO SIGNAL INPUT CONDITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

EXPLODED VIEW OF CHASSIS AND CABINET

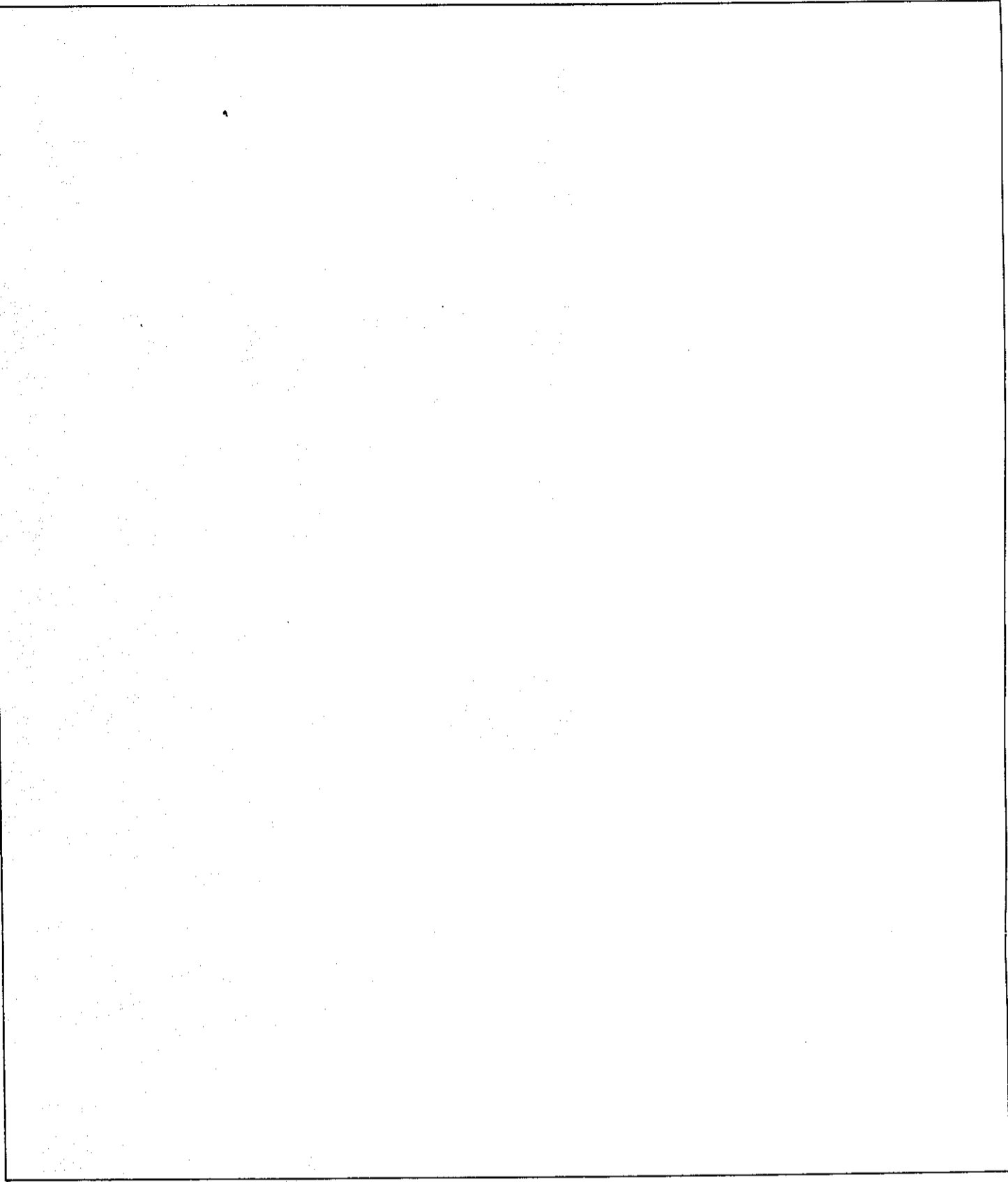
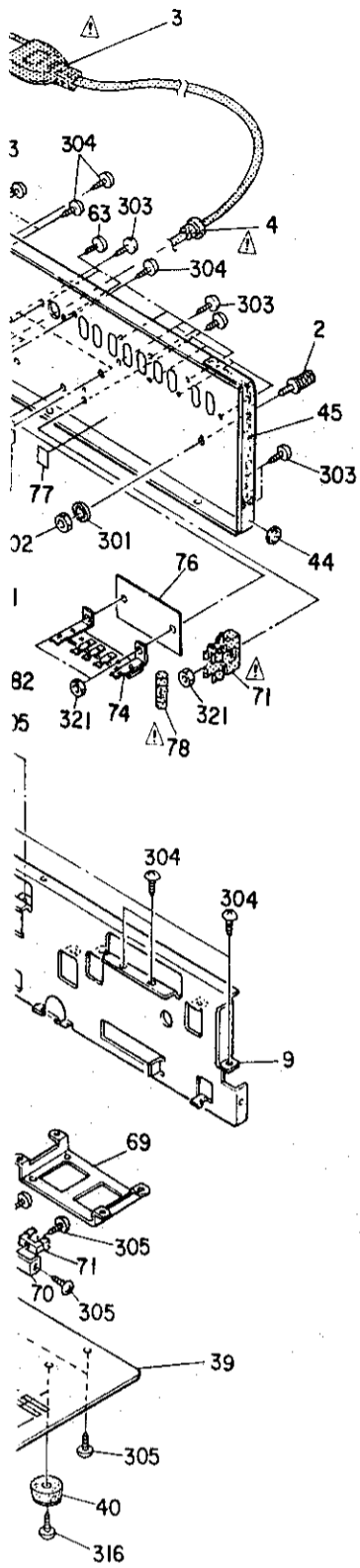


EXPLODED VIEW OF PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.
1	1059014004	BACK PANEL	38	EP-6214	CORD HOLDER USED 3	76	4150088004	INSULATING SHEET	30
2	2050043109	GND TERMINAL	39	1050577100	BOTTOM COVER	*77	5130654020	FUSE LABEL (T5.0A)	30
3	2050043109	CORD HOLDER	40	1040027107	FOOT	78	2050043109	FUSE LABEL	30
4	4450033005	CORD BUSH	41	2032095188	2P CONNECTOR CORD USED 2	*79	5130716023	FTZ LABEL	30
5	4140332100	SHIELD PLATE	42	2030241031	1P CONTACT ASS'Y	80	2050043109	FUSE LABEL	30
6	2050144008	8P TERMINAL	44	1040034006	STOPPER USED 4	81	419002008	HEAT SINK	30
7	4110400208	SIDE CHASSIS (L)	45	1220089088	SPACER USED 2	82	EP-6549	1PW TERMINAL	30
8	4110400211	SIDE CHASSIS (R)	46	4610136014	RUBBER SHEET USED 2	83	419002008	HEAT SINK	30
9	4110399306	MAIN CHASSIS	47	1140056007	FLEXIBLE RING	84	2050043109	FUSE LABEL	30
10	4110402002	TRANS CHASSIS ASS'Y	48	1130515134	PUSH KNOB (A)	85	2050043109	FUSE LABEL	30
11	4170212009	POWER RADIATOR	49	1441166201	FRONT PANEL ASS'Y	*86	5139119003	FUSE LABEL	31
12	4410411104	PCB BRACKET	50	1130513233	PUSH KNOB (B) ASS'Y USED 4	87	4410423008	EARTH BRACKET	31
13	2730273024	TRANSISTOR 2SC2581LB(O)/(Y)	51	1130514119	PUSH KNOB (C) ASS'Y USED 2	88	2050205002	2P W TERMINAL	31
14	2710160021	TRANSISTOR 2SA1106LB(O)/(Y)	52	4630367106	COIL SPRING USED 2	89	2050069002	5P W TERMINAL	31
15	4150234007	INSULATING SHEET	53	1310113000	DENON MARK	90	2050043109	FUSE LABEL	31
16	2760289004	POSISTOR PTH487A01BD222TS	54	1441155005	SIDE ESC. BAR (L)	91	2050043109	FUSE LABEL	31
17	4110398307	FRONT CHASSIS	55	1441156004	SIDE ESC. BAR (R)	92	2048059008	DIN JACK (5P)	31
18	4410404001	SWITCH BRACKET	56	4410406009	SIDE BRACKET (L)	93			31
19	4140349009	SHIELD BRACKET	57	4410407008	SIDE BRACKET (R)	94			31
20	4150270003	INSULATING SHEET	58	ETC0667D2	LED UNIT	95			31
21	2120243004	ROTARY SWITCH	59	2036115006	4P CONNECTOR ASS'Y	96			32
22	ETC0668D6	H.P JACK UNIT	60	ETC0667D3	LED UNIT	97			32
23	ETC0667D	TONE & POWER UNIT	61	ETC0667D4	LED UNIT	98			32
24	4410419009	CORNER BRACKET (L)	62	ETC0667D5	LED UNIT	99			32
25	4410420001	CORNER BRACKET (R)	63	4770096007	PUSH RIVET USED 9	100			32
26	2120239005	ROTARY REMOTE SW (INPUT SEL)	64	1120436100	KNOB (A)	PACKING & ACCESSORIES (not included EXPLODED VIEW)			
27	2120242005	ROTARY REMOTE SW (REC OUT)	65	1120435004	KNOB (B) USED 5				
28	2120241006	ROTARY REMOTE SW (TAPE MONITOR)	66	1120437002	KNOB (C) USED 3	a.	5040055007	CABINET SHEET	
29	2120240007	ROTARY REMOTE SW (MM-MC)	67	1020172302	TOP COVER	b.	5030447007	CUSHION (L,R)	
30	4350085001	FLEXIBLE SLIDER (INPUT)	68	1220064045	SPACER USED 2	c.	5019114005	CARTON CASE	
31	4350089007	FLEXIBLE SLIDER (REC OUT)	69	4121498209	CONDENSER BRACKET	d.	5119117009	INST. MANUAL	
32	ETC0668D3	TONE UNIT	70	4410426005	FUSE BRACKET	e.	5138295009	CONTROL CARD	
33	ETC0668D4	M. VOL & MUT SW UNIT	*71	2020013101	FUSE HOLDER	f.	2090012006	SHORT PIN USED 2	
34	ETC0668D	INPUT & EQ. UNIT	72	4410412200	LED HOLDER USED 6	g.			
35	ETC0670D	RECTIFIER UNIT	73	1220109007	BLIND SHEET USED 6	h.			
36	ETC0668D2	RELAY UNIT	74	2050089008	7PW TERMINAL				
*37	4450033005	WIRE CLAMP BAND USED 23							

important safety item, which must be replaced,
by a part specified or meeting the specification
ref.

DENON



NIPPON COLUMBIA CO., LTD.

No. 14-14, 4-CHOME AKASAKA,
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CABLE: NIPPONCOLUMBIA TOKYO

Printed in Japan

Part No.	Part Name & Descriptions	Q'ty
SCREWS AND OTHERS		
1	4753100004 TOOTH WASHER φ4	1
2	4770006000 NUT M4	1
3	4770064107 FIXING SCREW	8
4	4730354035 TAPPING SCREW (2) 3x8 (BLACK)	35
5	4730354019 TAPPING SCREW (2) 3x8	64
6	4700012022 PAN SCREW WITH W. SP 3x12	8
7	— TOOTH WASHER φ7	2
8	— NUT M9	3
9	— NUT M12	1
0	— NUT M7	5
1	4711303018 PAN SCREW	8
2	SC-06272 FIX. SCREW	2
3	— WASHER φ9	2
4	— TOOTH WASHER φ8	1
5	— NUT M8	1
6	4730459011 TAPPING SCREW (2) 4x16	4
7	4700030017 TAPPING SCREW (2) 4x8	4
8	4734801005 TAPPING SCREW (TRUS) 4x8	4
9	4770088002 WASHER φ4.1	1
0	4700042005 PAN SCREW WITH SW 3x8 (BLACK)	3
1	4756006008 NUT M3	3
2	— TOOTH WASHER φ9	1

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.		
		EA for Australia	EK for U.K.	
1	BACK PANEL			
2	AC CORD			
3	CORD BUSH			
4	POWER TRANS.			

* Marked not included EXPLODED VIEW.